



CHESAPEAKE BAY COMMISSION

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Characterizing “Uncertainty” for Establishing Nutrient Trading Ratios (DRAFT)

Premise: If it is possible to list out the specific characteristics that comprise the “uncertainty” that generates the need for a trading ratio (point trading with nonpoint), then policymakers can be informed about what constitutes any unmanaged uncertainty or risk and then establish a trading ratio accordingly. It is generally agreed that uncertainties exist; it is not clear how to translate our knowledge of these uncertainties into a responsible, defensible trading ratio.

This document focuses on agricultural BMPs since agriculture has the greatest assigned reduction in nutrients and sediment and is also considered a significant source of potential credits for a nutrient trading market.

Sources of uncertainty:

A. Uncertainty in knowledge base for BMPs

1. Wide variations in amount of research and data for different BMPs
2. Wide variation in efficiencies for the same BMP from different research projects
3. Substantial uncertainty remains for the BMPs with the most efficiency data
 - a. Substantial data but mostly in one hydrologic/geomorphic/soils setting
 - b. Substantial data but is plot or transect rather than watershed or landscape based
 - c. Recent research may indicate lower efficiency than larger body of previous work
4. Knowledge base for “most certain” BMPs (as a result of above) have substantial uncertainty; even “land use change” BMPs have uncertainty related to former versus converted land use load estimates

B. Unaccountable variation in BMP efficiencies (science-based estimate of effectiveness, not site specific)

1. Different efficiencies between soils, hydrologic and geographic regions that could not be accounted for in efficiency estimate
2. Where the practice is located on the local landscape(e.g. proximity to stream) cannot be accounted for in efficiency except for BMPs related to streams (e.g. buffers, fencing, stream restoration)
3. Soils, slope, rainfall, climatic zone vary widely across region
4. Physical variants allowed in definition or by federal, state or local standard (i.e. buffer width)
5. Inter-annual climatic fluctuation impact on efficiency (even if climate change is not considered)

C. Uncertainty in BMP performance (site specific)

1. Effect of adjacent land uses
2. Effect of man-made alterations to BMP
3. Operational ability and management variability (by producers)
4. Market, economic and other factors that impact farmer BMP management relative to definition (e.g. high corn prices, plant corn in grass buffers, waterways, etc.)
5. Weather incidence beyond design parameters
 - a. Storm frequency and intensity
 - b. Drought frequency and intensity
 - c. Flood frequency

D. BMP verification (programmatic- based)

1. Technical adequacy of planning and design staff
2. Technical adequacy of completion inspection staff
3. Technical adequacy of monitoring staff
4. Adequacy of BMP plan and design
5. Adequacy of installation and “as built” completion
6. Allowed design and implementation compared to CBP BMP definition
7. Periodic inspection (frequency, method)
8. Adequacy of data collection and tracking systems
9. Adequacy of data compiling and reporting systems
10. Oversight of verification process (audit)
11. Inadequate staff levels for verification (public/private)
12. Conflicts of interest (verifier or his/her employer implemented or cost-shared BMP)
13. Local SWCD Boards and state and federal agencies reluctance to enforce cost-share contract provisions (based on historical evidence) limits staff verification rigor and farmer concern over contract compliance

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